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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/935,185	08/22/2001	Kimiaki Ando	1743/190	1525

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EXAMINER

JOHNSTON, PHILLIP A

ART UNIT PAPER NUMBER

2881

DATE MAILED: 09/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/935,185

Applicant(s)

ANDO ET AL.

Examiner

Phillip A Johnston

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Detailed Action

Claims Rejection – 35 U.S.C. 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1,3,4,6, and amended Claims 2, and 5 stand rejected under 35 U.S.C. 102(e) as being anticipated by Miyajima (604) for the reasons stated in the first office action (Paper No. 4).

3. New Claims 7-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyajima (604) for the reasons stated in the first office action (Paper No. 4).

Miyajima also discloses, that after the pattern modification process in step S6 or the dividing process in step S7 is completed for all the first pattern data, the CPU 32

receives individual pattern data from the fourth to sixth data files 44-46, and converts the format of the individual pattern data to the proper format for the exposure apparatus to generate exposure data (exposure data generating process) in step S8. The CPU 32 stores the generated exposure data in the seventh data file 47. This completes the exposure data generating process.

The exposure apparatus shown in FIG. 1 receives from the exposure data generating apparatus 31 the exposure data stored in the seventh data file 47 and uses the exposure data to expose the desired pattern at a predetermined position on the wafer 23 while controlling the first to third electromagnetic deflectors 19-21 and the stage 22.

FIG. 6 is a flowchart illustrating substeps of step 6, the shape modification process. In step S11, the CPU 32 reads the first pattern data from the third data file 43, and then recognizes if one pattern data is triangular or rectangular (shape recognition process) in step S12. The shape recognition process is performed such that different modification processes are executed according to recognized shapes.

In step S13, the CPU 32 determined if the recognized first pattern data is rectangular (rectangular determination process). When the first pattern data is rectangular, no shape modification is needed and the CPU 32 moves from step S13 to step S20 to read the next first pattern data. When the first pattern data is not rectangular, the CPU 32 moves from step S13 to step S14 to perform a shape modification process on this first pattern data.

In step S14, the CPU 32 acquires from the first pattern data the amount of change that is used as a modification determination value (amount-of-change computing process). The amount of change represents a difference between the original first pattern data and the modified first pattern data produced by modifying the first pattern data to exposable predetermined pattern data. The shape of the pattern data is determined by values such as the coordinates of a side and the angle of the side. In this embodiment, a difference between the side coordinates of the original first pattern data and the side coordinates of the modified first pattern data is defined as the "amount of change".

When the first pattern data is triangular, the CPU 32 specifies two sides that define the largest one of the three internal angles. When the first pattern data is rectangular, the CPU 32 specifies two opposite sides. The CPU 32 acquires the amount of change that is produced by shifting at least one of the specified two sides in the horizontal direction (parallel to the X axis) or the vertical direction (perpendicular to the X axis and parallel to the Y axis). See Column 7, line 34-67; and Column 8, line 1-17.

Examiners Response to Arguments

4. Applicant's arguments filed 7-02-2003 have been fully considered but they are not persuasive.

Argument 1.

Applicant states, that "Miyajima et al. also discloses a method of projecting a beam passed through the plate on the block pattern of the stencil mask 12 (conventional block exposure system), wherein the deflector of Fig. 1 is adapted to project the beam passed through the plate 11 to the block pattern of the stencil mark. Despite what is shown here Applicants want to make it clear that Miyajima et al. does not disclose making the size of the block pattern variable by deflection.

This is where the presently claimed invention is patentably distinct from what is taught in the reference. That is, in contrast to this art, the claimed invention requires a deflection, which makes the size of the parallelogram variable. Miyajima et al. fails to show this feature of the claimed invention."

The applicant is respectfully directed to Miyajima (604), Column 1, line 10-47, which states; FIG. 1 is a schematic diagram of an electron beam (EB) exposure apparatus. The EB exposure apparatus has a stencil mask (or block mask) 12 and a plate 11 having a rectangular opening 13. As shown in FIG. 2, the stencil mask 12 has a plurality of first transmission apertures 14 having rectangular shapes, and a plurality of block areas 15. An electron beam 10 is deflected by a first electromagnetic deflector 19 before passing the plate 11. The electron beam 10 is

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then deflected by a second electromagnetic deflector 20 before passing any one of the first to third transmission apertures 14-17 of the stencil mask 12. Accordingly, the cross-sectional shape of the electron beam 10 or the shape of its exposure pattern is changed. The electron beam 10 after it has passed the stencil mask 12 is further deflected by a third electromagnetic deflector 21. As a platform or stage 22 is moved along the X and Y axes, a desired pattern is exposed on a predetermined area of a wafer 23 located on the stage 22. The size of a rectangular pattern exposed on the wafer 23 is determined by adjusting the degree of overlapping of the beam passing through the plate 11 with the associated first transmission aperture 14. This exposure scheme is called a variable rectangular system.

The examiner has interpreted from the Miyajima (604) reference above that plate 11 has a rectangular aperture, and the beam passing through is deflected across the appropriate pattern on aperture plate 12, such that the degree of overlapping of the beam determines the size of the pattern drawn on the wafer. In other words the deflection of the beam across the aperture is used to adjust the size of the beam incident upon the wafer.

The examiner has also interpreted from the Miyajima (604) reference above, that the first aperture (in plate 11) is a quadrangle, and the second aperture in plate 12 is a second parallelogrammatic aperture, as recited in Claims 1,5,7, and 14, wherein the shape (size) of the parallelogram drawn on the wafer surface is made variable by the deflectors.

Argument 2.

Applicant also states, that "In short, Miyajima et al. requires pattern processing (correction) by his CPU so that fixed size block patterns can be used effectively, and thus is based on the premises that the block pattern is not variable in size. In contrast to this, the claimed invention requires that the parallelogram beam (plus right angled triangle beam) be variable in size for drawing an oblique edge."

The applicant is respectfully directed to Column 7, line 34-48, which states; After the pattern modification process in step S6 or the dividing process in step S7 is completed for all the first pattern data, the CPU 32 receives individual pattern data from the fourth to sixth data files 44-46, and converts the format of the individual pattern data to the proper format for the exposure apparatus to generate exposure data (exposure data generating process) in step S8. The CPU 32 stores the generated exposure data in the seventh data file 47. This completes the exposure data generating process.

The exposure apparatus shown in FIG. 1 receives from the exposure data generating apparatus 31 the exposure data stored in the seventh data file 47 and uses the exposure data to expose the desired pattern at a predetermined position on the wafer 23 while controlling the first to third electromagnetic deflectors 19-21 and the stage 22.

The examiner has interpreted from the Miyajima (604) reference above that after corrected exposure data is generated and stored in the CPU, the data is then used to

control the deflectors of the apparatus, thereby varying the beam shape as described above, such that the desired pattern can be exposed on the wafer.

Conclusion

3. The Amendment filed on 7-02-2003 under 37 CFR 1.131 has been considered but is ineffective to overcome the Miyajima (604) references.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip A Johnston whose telephone number is 305 7022. The examiner can normally be reached on 7:30 to 4:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for

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the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ
September 8, 2003


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800